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*Fire Insurance and How to Build.* By FRANCIS O. MOORE. New York: The Baker & Taylor Co., 1903. 8vo, pp. 860.

AN excursion into the field of fire-insurance literature is not ordinarily so accompanied by pleasure as to be undertaken for its own sake. One who, for any reason, has ever plunged into the jungle of the "Chronicle Fire Tables," or the statistical desert of the great fire-department reports, or who has attempted to cull the scanty fruit from the volumes of the fire underwriters' associations' reports and the fire-insurance journals, knows the feeling of the proverbial burned child.

Mr. Frances O. Moore has written a book which is an exception to this general rule. This work is apparently intended to serve primarily as a text-book or guide for fire-insurance agents, but it will interest a wider circle of readers. For there are many interesting bits of discussion on moot points in the theory of fire insurance interspersed amid the sage advice to agents and the mandatory rules for their daily conduct more common in such guides. Of these theoretical discussions perhaps the most important are: the vigorous argument in defense of "schedule rating," together with the lucid explanation of the so-called "Universal Mercantile Schedule," and the attempted solution of the problem of "co-insurance." It is with these that this review is mainly concerned. There is also much practical information concerning the best methods of guarding against fire in the construction of buildings—all of which cannot fail to be of interest and value to architects and builders. The 1902 edition of the "Standard Universal Schedule for Rating Mercantile Risks" is reprinted as a whole.

The author, for many years president of the Continental Insurance Co. is well known to all readers of fire-insurance literature as the chairman of the Universal Schedule Committee and one of the most ardent advocates of rating by schedule. By lifelong experience and knowledge he is well qualified for the task of preparing such a treatise. The style is that of a plain business man, making little pretense to literary art; the book is not divided into chapters, has no table of contents, and the subjects treated are scattered about in a somewhat erratic manner. But the thought is always clear and often attractively presented.

The reasons why fire-insurance literature is almost always dull are the entire absence of guiding principles, and the consequent lack of system. There are no beaten paths, and the multitude of diverse ideas never fall into orderly ranks. In this respect it presents a strong contrast to the literature of life insurance. Whether it be that the idea of

a providential order ruling in the lives and deaths of human beings, as suggested by Süssmilch, computed by Halley, and established by our modern life-tables, appeals to the religious instinct of the race, or whether there be a sort of dreadful fascination about death which rivets the attention, certain it is that all men take an interest in such a conception as the bridge of life in Addison's "Vision of Mirza" and Pearson's "Chances of Death;" and of such and similar things is the science and literature of life insurance built up. It is a fundamental tenet of life insurance that there is a "wonderful form of cosmic order" in the "law of frequency," that "supreme law of unreason" which, as Francis Galton so aptly said, the Greeks would have worshiped had they but discovered it. The same law undoubtedly applies to fires and their recurrence, but the "chances" have not been computed, and the sole guiding principle at present applied in fire insurance is that expressed by the homely proverb: "Don't put all the eggs in one basket." To the average man a "game of chance" remains such only so long as a considerable number of the "probabilities" involved are unknown to most of the players. As soon as the players can "compute" the "chances," the "game" becomes a "science." Fire insurance still plays with too many unknown chances to obtain in this sense the appellation of a "science." This will not always be the case. For although it is hardly probable that fire insurance will ever come to depend upon science to the same extent that life insurance does, yet much more than is now known can be learned concerning its laws and the probability of loss by fire. Nobody will be so rash as to deny that the occurrence of fires and the amount of loss they entail are, like any other series of events affecting human welfare and the result of human actions, governed by, or at least fall under, some empirical law which it is perfectly possible to discover. As yet, however, the law is but vaguely known; and even the method of its formulation remains to be determined.

The problem involved in determining the law underlying losses by fire is much more complex than that presented in the case of life insurance. There is no such thing as a partial death known to life insurance, but a building and goods must be insured against partial loss by fire. Diseased lives are not insured, but badly constructed fire-trap houses and their contents must be. A life has no market value to fluctuate day by day, and there is nothing to consider but the face of the policy; but the property covered by a fire policy does fluctuate in value, and the face of the policy is simply a limit of liability. Unless

there is some known reason for making a difference, one healthy life is much like any other, save in the sole respect of age; and age classes are comparatively few, and progress from one to another is definite and certain. The classes of fire risks with respect to liability to damage or destruction are legion, their nature is such as to well-nigh defy classification, and in many instances that liability fluctuates from day to day.

Complex as the problem is, the statistical data necessary for its solution are not impossible to compile, and the interests at stake are great enough to warrant considerable expense in their collection. That fire underwriters have not more generally attempted the use of scientifically compiled statistics, but prefer to depend upon unanalyzed judgments based upon their own business experience is probably explained by the fact that a satisfactory method of solving the problem has never been devised, were the statistics at hand. Two features of Mr. Moore's book suggest the possible lines of advance: one is the presentation of schedule rating, the other the discussion of co-insurance.

Schedule rating may be looked upon from two very different points of view. From one point of view it may be regarded as an attempt to penalize the insured for certain enumerated defects or faults of construction, environment, etc., which increase the risk, and to reward him for certain good features which lessen the danger and conduce to his own and the company's protection. When so regarded it is largely a practical expedient for educating the public and cutting down the amount of the losses to be paid. But it may be regarded from an entirely different point of view, and one which to the student of fire-insurance theory is certainly most interesting and suggestive. From this point of view schedule rating is an attempt to analyze each hazard into its component parts, and to build up the rate in each case by a series of charges for dangerous features and credits for protective features. Thus, to find the rate for a given building we start with a general basis rate (or key rate), as the first charge, which represents the estimated cost of carrying a carefully defined standard building of a given class in a standard environment (or, of course, goods of a given class in such a building); then every deviation from the standard which is found in the particular risk is rated according to a fixed tariff and set down with an appropriate credit or charge, as the case may be, and the balance which is finally struck gives the rate sought. We have thus in the schedule an authentic list of what hundreds of underwriters have

agreed are merits or demerits in construction and affect the hazard. In one form or another schedule rating now prevails in practically all large cities, at least within the fire limits. In practice the basis rate is assumed at some convenient round number of cents on the hundred dollars nearest that amount which the roughly estimated experience of the past has suggested to be a safe charge. The credits and charges for deviations from the standard are similarly estimated. Herein lies the weakness of schedule rating. These quantities should all be measured by careful statistical investigations; they should not be merely guessed at. But the adoption of the schedule suggests exactly what should be sought, and renders it possible to get the exact facts and figures that will be needed for a solution of the problems involved in fire insurance.

The basis, or key rate, as it is variously called, is an exceedingly interesting conception. It is supposed to represent the normal cost of insurance; that is, the duly apportioned losses for a normal risk of a particular class, plus expenses. Its definition has given rise to a very amusing controversy between Mr. Moore and Mr. Dean, the latter the author of an interesting book entitled *Fire Rating as a Science*, in which an attempt is made to show that fire losses run in waves. Mr. Dean described the basis rate by the accurate, if high-sounding, phrase "the residuum of unanalyzed hazard," the items specified in the schedule being in his thought the analyzed hazard. This phrase was greeted with some ridicule by Mr. Moore and his friends, to whom Mr. Dean replied that "a starting-point (Mr. Moore's term) was no definition. The controversy exemplifies a confusion of thought that is not at all uncommon. It is not clear to some whether this basis rate is the debit balance (as it were) which has to be charged in order to bring the account out straight, or whether it is really the first and most essential entry in the account.

Whatever the merits or demerits of schedule rating, it is clear that it is full of promise for a more scientific treatment of fire insurance in the future, if for the sole reason that it lists the items a correct measurement of which must be sought.

With the advent of the so-called fireproof building and of slow-burning construction on which partial losses to the property are the rule, fire underwriters have had their attention forced, as never before, to a consideration of the relation between the insurance and the value of the property insured. The assured, in such cases, taking into consideration that in case of a fire the damage will be restricted, carries

insurance for, we will say, only 20 per cent. of the entire value of the building, and it may easily happen that what is a partial loss on the building is a total loss to the underwriter. In other words, such buildings do not, on account of under-insurance, contribute their fair share of revenue to the companies, nor their owners bear their due and equitable share of the losses of the community as a whole, always taking into consideration the amount of losses they occasion and make the community bear. Under the somewhat clumsy name of "co-insurance," underwriters have begun to apply an equally clumsy device, though the best available at present, for the correction of this evil.

This device is an adaptation of the principle of the "average" which is familiar in marine insurance. The name recalls the practice of great navies in granting an escort to merchant vessels and dividing the cost of such scant protection as they afforded between the owners of the hulls and the cargoes and the recipients of the freights, in proportion to their respective interests. The force of the co-insurance or average clause, as is well known, is to make the underwriter responsible for that proportion of any loss which the face of the policy bears to the total value of the property or to an especially agreed upon proportion of the value. In other words, the owner carries his own insurance (or insures in other companies) for the remainder of the property, and a loss if it occurs is divided between the two.

This device is a clumsy one, because it dodges the issue and does not solve the real problem. If it be assumed that 80 per cent. of the total value of the property is the correct amount of insurance to be carried, so that the owner may still have some interest in protecting his property, and the rates have been fixed, as they usually are roughly, with reference to the proportion which the losses bear to say 80 per cent. of the value of all property insured, then it is clear that if the owner carries less than 80 per cent. without the co-insurance clause, the rate is inadequate. The best remedy is not to apply the co-insurance clause, but to grade the rates in proportion to the fraction of the value insured, the premium rate per \$100 increasing as the fraction of the total property insured decreases. The practice of fixing the rates, in classes where short insurance is most likely to be carried, high enough to cover the cost when only, say, 20 per cent. is carried, and then making a reduction for co-insurance is a "topsy-turvy" way of getting at the result. The fire waste, which the community as a whole attempts to distribute equitably over all the owners of property through the agency of fire insurance, is best conceived of and expressed as a per-

centage of the value of the property, and consequently the premium rate should be expressed as a proportion of the value of the property. (This is in no sense to be regarded as an advocacy of a "valued policy.") Short insurance will increase the percentage of "incurred loss" to "premiums earned" (the usual test as to whether the business "pays" or is self-sustaining), even when the actual fire waste is decreasing. Although Mr. Moore says confidently "there is no reason why a rate cannot be graded according to the amount of insurance carried," there are two reasons why that has never been done in the past, save to a limited extent in the case of fireproof buildings when rated by schedule. In the first place, an accurate valuation of the property is expensive and often prohibitively so; and it is often necessary to place a policy on goods the identity of which may actually change and the value of which is expected to change as time goes on. This difficulty can, however be overcome in certain classes, and especially in those classes where short insurance is the practice; in other cases it does not apply. In the second place the mathematical problem involved is a very intricate one. Mr. Moore and his associates on the Universal Schedule Committee adopted a table for the graduation of the rates in the case of fireproof buildings when co-insurance is arranged, but it is compiled by some rule-of-thumb method and is in no sense properly proportioned.

The great gain which will come to fire underwriting from the recent development of co-insurance will arise from the establishment of a definite relationship between the value of the property and the premium charged. This, in the opinion of the writer of this review, is the foundation of scientific rate-making. With this and the method of analysis furnished by schedule rating "all things are possible."

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*Legal Tender: A Study in English and American Monetary History.* By SOPHONISBA PRESTON BRECKINRIDGE ("The Decennial Publications," Second Series, Vol. VII). Chicago: The University of Chicago Press 1903. 8vo, pp. xviii + 181.

It is a pleasure to review a piece of work so well done as is this history of legal tender by Miss Breckinridge. In it the exercise of the power to determine what shall be a legal tender for debts or